WHAT IS CLAIMED IS:

1. A method for producing carbon nanotube particulates, comprising:

   (a) providing a catalyst comprising catalytic metal on a particulate support, wherein the particulate support has a cross-sectional dimension of less than about 1000 microns,

   (b) contacting the catalyst with a gaseous stream comprising a carbon-containing feedstock at a sufficient temperature and for a contact time sufficient to make a carbon product on the catalyst wherein the carbon product comprises carbon nanotube particulates, wherein the particulates comprise small-diameter carbon nanotubes, wherein the small-diameter carbon nanotubes have a outer diameter in the range of about 0.5 nm and about 3 nm, and

   (c) removing the particulate support from the carbon product comprising the carbon nanotube particulates, wherein the carbon nanotube particulates retain a macroscopic morphology of an approximate shape and an approximate cross-sectional dimension as before removal of the particulate support.

2. The method of claim 1 wherein the small-diameter carbon nanotubes are selected from the group consisting of single-wall carbon nanotubes, double-wall carbon nanotubes, triple-wall carbon nanotubes, quadruple-wall carbon nanotubes and combinations thereof.

3. The method of claim 1 wherein the particulate support comprises a material selected from the group consisting of zeolite, silica, alumina, zirconia, magnesia and combinations thereof.

4. The method of claim 1 wherein the particulate support comprises magnesia.

5. The method of claim 1 wherein the catalytic metal comprises at least one element selected from the group consisting of chromium, molybdenum, tungsten, iron,

cobalt, nickel, ruthenium, rhodium, palladium, osmium, iridium, platinum, a lanthanide series element, an actinide series element, and combinations thereof.

6. The method of claim 1 wherein the catalytic metal comprises iron.

7. The method of claim 1 wherein the catalytic metal comprises iron and molybdenum.

8. The method of claim 1 wherein the small-diameter carbon nanotube particulates have a bulk density in a range of about 0.01 g/cm^3 and about 0.5 g/cm^3.

9. The method of claim 1 wherein the particulate support has a cross-sectional dimension in a range of about 0.1 micron and about 1000 microns.

10. The method of claim 1 wherein the particulate support has a cross-sectional dimension in a range of about 1 micron and about 100 microns.

11. The method of claim 1 wherein the carbon nanotube particulates have a cross-sectional dimension in the range of about 0.1 micron and about 1000 microns.

12. The method of claim 1 wherein the carbon nanotube particulates have a cross-sectional dimension in the range of about 1 micron and about 100 microns.

13. The method of claim 1 wherein the small-diameter carbon nanotubes are present in the small-diameter carbon nanotube particulates in an amount greater than about 50 wt% of a total weight of the carbon product.

14. The method of claim 1 wherein the small-diameter carbon nanotubes are present in the small-diameter carbon nanotube particulates in an amount greater than about 80 wt% of a total weight of the carbon product.

15. The method of claim 1 wherein the small-diameter carbon nanotubes are present in the small-diameter carbon nanotube particulate in an amount greater than about 90 wt% of a total weight of the carbon product.

16. The method of claim 1 wherein the small-diameter carbon nanotubes span between more than one carbon nanotube particulate.

17. The method of claim 1 wherein the carbon particulates have a surface area in the range of about 10 m^2/g and about 1000 m^2/g.

18. The method of claim 1 wherein the carbon particulates have a surface area in the range of about 100 m^2/g and about 1000 m^2/g.

19. The method of claim 1 wherein the small-diameter carbon nanotubes in the carbon nanotube particulates comprise ropes of small-diameter carbon nanotubes.

20. The method of claim 19 wherein the ropes have a cross-sectional dimension in the range of about 10 nm and about 50 nm.

21. The method of claim 19 wherein the ropes have a cross-sectional dimension of less than 10 nm.

22. The method of claim 1 wherein the carbon nanotube particulates comprise small-diameter carbon nanotubes having more than about 10 small-diameter carbon nanotubes/μm^2 surface area of the carbon nanotube particulates.

23. The method of claim 1 further comprising annealing the carbon nanotube particulates to form annealed carbon nanotube particulates.

24. The method of claim 23 wherein the annealing is done by heating the carbon nanotube particulates in nitrogen or an inert gas environment at a temperature between about 800°C and 1500°C for a time in the range of about 1 and about 24 hours.

25. The method of claim 23 wherein the annealed carbon nanotube particulates are stable in air at a temperature greater than about 400°C.

26. The method of claim 23 wherein the annealed carbon nanotube particulates are stable in air at a temperature greater than about 450°C.

27. The method of claim 23 wherein the annealed carbon nanotube particulates are stable in air at a temperature greater than about 500°C.

28. The method of claim 23 wherein the annealed carbon nanotube particulates are stable in air at a temperature greater than about 550°C.

29. The method of claim 1 wherein the carbon nanotube particulates are blended with a matrix material selected from the group consisting of thermoplastic polymers, thermoset polymers, metals, ceramics, and combinations thereof.

30. The method of claim 1 wherein the carbon nanotube particulates are blended with a matrix material that comprises a polymer.

31. The method of claim 1 further comprising derivatizing the carbon nanotubes to form derivatized carbon nanotubes.

32. The method of claim 31 wherein the dervatized carbon nanotubes are fluorinated carbon nanotubes.

33. The method of claim 31 wherein the derivatized carbon nanotubes comprise one or more functional groups.

34. The method of claim 31 wherein the carbon nanotube particulates comprising the derivatized carbon nanotubes are blended with a matrix material selected from the group consisting of thermoplastic polymers, thermoset polymers, metals, ceramics, and combinations thereof

35. The method of claim 32 wherein the carbon nanotube particulates comprising the fluorinated carbon nanotubes are blended with a matrix material selected from the group consisting of thermoplastic polymers, thermoset polymers, metals, ceramics, and combinations thereof

36. The method of claim 33 wherein the carbon nanotube particulates comprising the derivatized carbon nanotubes comprising one or more functional groups are blended with a matrix material selected from the group consisting of

thermoplastic polymers, thermoset polymers, metals, ceramics, and combinations thereof.

37. A carbon nanotube particulate comprising a plurality of small-diameter carbon nanotubes arranged in a 3-dimensional network in the carbon nanotube particulate, wherein the carbon nanotube particulate has a cross-sectional dimension of less than about 1000 microns and wherein the small-diameter carbon nanotubes have a diameter in the range of about 0.5 nm and about 3 nm.

38. The carbon nanotube particulate of claim 37 wherein the small-diameter carbon nanotubes are selected from the group consisting of single-walled carbon nanotubes, double-walled carbon nanotubes, triple-walled carbon nanotubes, quadruple-walled carbon nanotubes and combinations thereof.

39. The carbon nanotube particulate of claim 37 wherein the carbon nanotube particulate has a bulk density in a range of about 0.01 g/cm^3 and about 0.5 g/cm^3.

40. The carbon nanotube particulate of claim 37 wherein the carbon nanotube particulate has a cross-sectional dimension in the range of about 0.1 micron and about 1000 microns.

41. The carbon nanotube particulate of claim 37 wherein the carbon nanotube particulate has a cross-sectional dimension in the range of about 1 micron and about 100 microns.

42. The carbon nanotube particulate of claim 37 wherein the small-diameter carbon nanotubes span between more than one carbon nanotube particulate.

43. The carbon nanotube particulate of claim 37 wherein the carbon nanotube particulate has a surface area in the range of about 100 m^2/g and about 1000 m^2/g.

44. The carbon nanotube particulate of claim 37 wherein the carbon nanotube particulate comprises ropes of small-diameter carbon nanotubes.

45. The carbon nanotube particulate of claim 44 wherein the ropes have a cross-sectional dimension in a range of about 10 nm and about 50 nm.

46. The carbon nanotube particulate of claim 44 wherein the ropes have a cross-sectional dimension less than 10 nm.

47. The carbon nanotube particulate of claim 37 wherein the carbon nanotube particulate is annealed to form an annealed carbon nanotube particulate.

48. The carbon nanotube particulate of claim 47 wherein the annealed carbon nanotube particulate is stable in air at a temperature greater than about 400°C.

49. The carbon nanotube particulate of claim 47 wherein the annealed carbon nanotube particulate is stable in air at a temperature in excess of about 450°C.

50. The carbon nanotube particulate of claim 47 wherein the annealed carbon nanotube particulate is stable in air at a temperature in excess of about 500°C.

51. The carbon nanotube particulate of claim 47 wherein the annealed carbon nanotube particulate is stable in air at a temperature in excess of about 550°C.

52. The carbon nanotube particulate of claim 47 wherein a plurality of carbon nanotube particulates are present in a matrix material, wherein the plurality of carbon nanotube particulates is present at a concentration in the range of about 0.001 wt% and about 50 wt%.

53. The carbon nanotube particulate of claim 52 wherein the matrix material is selected from the group consisting of thermoplastic polymers, thermoset polymers, metals, ceramics, and combinations thereof

54. The carbon nanotube particulate of claim 37 wherein a plurality of carbon nanotube particulates are present in a matrix material comprising a polymer, wherein the plurality of carbon nanotube particulates is present at a concentration in a range of about 0.001 wt% and about 50 wt%.

55. The carbon nanotube particulate of claim 37 wherein the carbon nanotubes are derivatized carbon nanotubes.

56. The carbon nanotube particulate of claim 37 wherein the carbon nanotubes are fluorinated.fluorinated carbon nanotubes.

57. The carbon nanotube particulate of claim 55 wherein the derivatized carbon nanotubes comprise one or more functional groups.

58. The carbon nanotube particulate of claim 55 wherein the carbon nanotube particulates comprising the derivatized carbon nanotubes are in a composite material comprising a matrix material selected from the group consisting of thermoplastic polymers, thermoset polymers, metals, ceramics, and combinations thereof.

59. The carbon nanotube particulate of claim 56 the carbon nanotube particulates comprising the fluorinated carbon nanotubes are in a composite material comprising a matrix material selected from the group consisting of thermoplastic polymers, thermoset polymers, metals, ceramics, and combinations thereof.

60. The carbon nanotube particulate of claim 57 wherein the carbon nanotube particulates comprising the derivatized carbon nanotubes comprising one or more functional groups are in a composite material comprising a matrix material selected from the group consisting of thermoplastic polymers, thermoset polymers, metals, ceramics, and combinations thereof.

61. The carbon nanotube particulate of claim 37 wherein the particulate is present in a field emission device.

62. The carbon nanotube particulate of claim 37 wherein the particulate is present in a cathode of a field emission device.

63. A method for producing carbon nanotube particulates, comprising:

(a) providing a catalyst comprising catalytic metal on a particulate support, wherein the particulate support has a cross-sectional dimension of less than about 1000 microns, and

(b) contacting the catalyst with a gaseous stream comprising a carbon-containing feedstock at a sufficient temperature and for a contact time sufficient to make a carbon product on the catalyst wherein the carbon product comprises carbon nanotube particulates wherein the carbon nanotube particulates comprise small-diameter carbon nanotubes, wherein the small-diameter carbon nanotubes have a outer diameter in the range of about 0.5 nm and about 3 nm.

64. The method of claim 63 further comprising removing the particulate support from the carbon product comprising the carbon nanotube particulates wherein the carbon nanotube particulates have a macroscopic morphology of an approximate shape as the particulate support and an approximate cross-sectional dimension as the particulate support.

65. The method of claim 63 wherein the small-diameter carbon nanotubes are selected from the group consisting of single-wall carbon nanotubes, double-wall carbon nanotubes, triple-wall carbon nanotubes, quadruple-wall carbon nanotubes and combinations thereof.

66. The method of claim 63 wherein the particulate support comprises a material selected from the group consisting of zeolite, silica, alumina, zirconia, magnesia and combinations thereof.

67. The method of claim 63 wherein the particulate support comprises magnesia.

68. The method of claim 63 wherein the catalytic metal comprises at least one element selected from the group consisting of chromium, molybdenum, tungsten, iron, cobalt, nickel, ruthenium, rhodium, palladium, osmium, iridium, platinum, a lanthanide series element, an actinide series element, and combinations thereof.

69. The method of claim 63 wherein the catalytic metal comprises iron.

70. The method of claim 63 wherein the catalytic metal comprises iron and molybdenum.

71. The method of claim 63 wherein the particulate support has a cross-sectional dimension in a range of about 0.1 micron and about 1000 microns.

72. The method of claim 63 wherein the particulate support has a cross-sectional dimension in a range of about 1 micron and about 100 microns.

73. The method of claim 63 wherein the small-diameter carbon nanotubes are present in the small-diameter carbon nanotube particulates in an amount greater than about 50 wt% of a total weight of the carbon product.

74. The method of claim 63 wherein the small-diameter carbon nanotubes are present in the small-diameter carbon nanotube particulates in an amount greater than about 80 wt% of a total weight of the carbon product.

75. The method of claim 63 wherein the small-diameter carbon nanotubes are present in the small-diameter carbon nanotube particulate in an amount greater than about 90 wt% of a total weight of the carbon product.

76. The method of claim 63 wherein the small-diameter carbon nanotubes span between more than one carbon nanotube particulate.

77. The method of claim 63 wherein the small-diameter carbon nanotubes in the carbon nanotube particulates comprise ropes of small-diameter carbon nanotubes.

78. The method of claim 78 wherein the ropes have a cross-sectional dimension in the range of about 10 nm and about 50 nm.

79. The method of claim 78 wherein the ropes have a cross-sectional dimension of less than 10 nm.

80. The method of claim 64 further comprising annealing the carbon nanotube particulates to form annealed carbon nanotube particulates.

81. The method of claim 80 wherein the annealing is done by heating the carbon nanotube particulates in nitrogen or an inert gas environment at a temperature between about 800°C and 1500°C for a time in the range of about 1 hour and about 24 hours.

82. The method of claim 80 wherein the annealed carbon nanotube particulates are stable in air at a temperature greater than about 400°C.

83. The method of claim 80 wherein the annealed carbon nanotube particulates are stable in air at a temperature greater than about 450°C.

84. The method of claim 80 wherein the annealed carbon nanotube particulates are stable in air at a temperature greater than about 500°C.

85. The method of claim 80 wherein the annealed carbon nanotube particulates are stable in air at a temperature greater than about 550°C.

86. The method of claim 80 wherein the carbon nanotube particulates are blended with a matrix material selected from the group consisting of thermoplastic polymers, thermoset polymers, metals, ceramics, and combinations thereof.

87. The method of claim 64 wherein the carbon nanotube particulates are blended with a matrix material that comprises a polymer.

88. The method of claim 64 further comprising derivatizing the carbon nanotubes to form derivatized carbon nanotubes.

89. The method of claim 88 wherein dervatized carbon nanotubes are fluorinated carbon nanotubes.

90. The method of claim 88 wherein the derivatized carbon nanotubes comprise one or more functional groups.

91. The method of claim 88 wherein the carbon nanotube particulates comprising the derivatized carbon nanotubes are blended with a matrix material selected from the group consisting of thermoplastic polymers, thermoset polymers, metals, ceramics, and combinations thereof

92. The method of claim 89 wherein the carbon nanotube particulates comprising the fluorinated carbon nanotubes are blended with a matrix material selected from the group consisting of thermoplastic polymers, thermoset polymers, metals, ceramics, and combinations thereof

93. The method of claim 90 wherein the carbon nanotube particulates comprising the derivatized carbon nanotubes comprising one or more functional groups are blended with a matrix material selected from the group consisting of thermoplastic polymers, thermoset polymers, metals, ceramics, and combinations thereof.

94. A product of the process, comprising:

(a) providing a catalyst comprising catalytic metal on a particulate support, wherein the particulate support has a cross-sectional dimension of less than about 1000 microns,

(b) contacting the catalyst with a gaseous stream comprising a carbon-containing feedstock at a sufficient temperature and for a contact time sufficient to make a carbon product on the catalyst wherein the carbon product comprises small-diameter carbon nanotubes, wherein the small-diameter carbon nanotubes have a outer diameter in the range of about 0.5 nm and about 3 nm, and

(c) removing the particulate support from the carbon product to form carbon nanotube particulates, wherein the carbon nanotube particulates retain a macroscopic morphology of an approximate shape and an approximate cross-sectional dimension as before removal of the particulate support.

95. The product of claim 94 further comprising annealing the carbon nanotube particulates.

96. The product of claim 94 wherein the small-diameter carbon nanotubes are selected from the group consisting of single-walled carbon nanotubes, double-walled carbon nanotubes, triple-walled carbon nanotubes, quadruple-walled carbon nanotubes and combinations thereof.